Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:

1. A method comprising the steps of:
acquiring MR data from multiple echoes in an echo train with a fast spin echo pulse sequence; and
correcting for amplitude modulation effects in the fast spin echo pulse sequence after data acquisition.

[c2] 2. The method of claim 1 wherein the of correcting includes the steps of:
acquiring at least one set of reference MR data;
determining a table of amplitude modulation correction values; and
applying at least a portion of the table to the acquired MR data.

[c3] 3. The method of claim 2 further comprising the steps of acquiring at least one set of reference MR data before and after acquisition of the MR data.

[c4] 4. The method of claim 2 further comprising the steps of acquiring cl081cl08 at least one set of reference MR data before acquisition of the MR data and acquiring a second portion of the at least one set of reference MR data after

acquisition of the MR data.

[c5] 5. The method of claim 2 wherein the at least one set of reference MR data includes non-phase encoded data.

[c6] 6. The method of claim 2 wherein the steps of applying includes the steps of:
multiplying each k-space view of the acquired MR data by a correction value in a corresponding k_y location in the table; and
carrying out the steps of multiplying prior to transformation of the acquired MR data from k-space to image space.

[c7] 7. The method of claim 2 wherein at two sets of reference data and further comprising the steps of averaging the two sets of reference data to determine the table of correction values.

[c8] 8. The method of claim 5 wherein the at least one set of reference data represents a maximum achievable signal that the acquired phase encoded MR data can attain.

[c9] 9. The method of claim 1 wherein the MR data is acquired via multiple receiver coils, and further comprising the steps of correcting for amplitude modulation effects in the MR data from each receiver coil independently.

[c10] 10. The method of claim 9 further comprising the steps of generating a combined image from corrected image data from each receiver coil.

[c11] 11. An MRI apparatus comprising:
a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and
a computer programmed to:
(A) acquire at least one set of reference MR data;
(B) determine a table of amplitude modulation correction values from the reference MR data;
(C) acquire MR data; and
(D) modify the acquired set of reference MR data by the table of amplitude modulation correction values.

[c12] 12. The MRI apparatus of claim 11 wherein the computer is further programmed to acquire the at least one set of reference MR data from one or more discarded acquisitions played out one of prior to and after acquisition of the MR data.

[c13] 13. The MRI apparatus of claim 11 wherein the computer is further programmed to acquire portions of the at least

one set of reference MR data prior to and after acquisition of the MR data.

[c14] 14. The MRI apparatus of claim 11 wherein the at least one set of reference MR data includes non-phase encoded data and the MR acquired MR data is modified while in k-space.

[c15] 15. The MRI apparatus of claim 11 wherein the computer is further programmed to acquire the MR data with a fast spin echo pulse sequence.

[c16] 16. The MRI apparatus of claim 11 wherein the RF coil assembly includes a phased array of receiver coils.

[c17] 17. The MRI apparatus of claim 16 wherein the computer is further programmed to carry out acts (A)-(D) independently for each receiver coil.

[c18] 18. The MRI apparatus of claim 11 wherein the computer is further programmed to generate an image space from the modified MR data.

[c19] 19. A computer readable storage medium having a computer program to execute a fast spin echo pulse sequence stored thereon and representing a set of instructions that when executed by a computer causes the computer to:

acquire non-phase encoded MR data;

acquire phase encoded MR data from multiple echoes; and

modify the phase encoded MR data by the non-phase encoded MR data to correct amplitude modulation between the multiple echoes.

[c20] 20. The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to acquire the non-phase encoded MR data from a series of discarded acquisitions played out at least one of before and after acquisition of the phase encoded MR data.

[c21] 21. T he computer readable storage medium of claim 19 wherein the phase encoded data includes one of 2D and 3D MR data.

[c22] 22.T he computer readable storage medium of claim 19 wherein the non-phase encoded MR data represents a maximum achievable signal that the phase encoded MR data can attain.

[c23] 23.T he computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to:

generate a set of amplitude correction values from the

non-phase encoded MR data;

arrange the set of amplitude correction values in a table dimensionally equivalent to a k-space of phase encoded MR data; and

modify each data point of k-space with a similarly positioned amplitude correction value.

[c24] 24.T he computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to amplitude correct acquired phased encoded MR data without increasing scan time.

[c25] 25.T he computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to carry out a pre-scan of a subject and acquire the non-phase encoded MR data after the pre-scan but before acquisition of the phase encoded MR data.

[c26] 26.T he computer readable storage medium of claim 19 incorporated into a computer data signal embodied in a carrier wave that is uploadable/downloadable to an MR imaging system.